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Report

Drawn up on behalf of the Committee on Energy and Research on the Common Research Policy : Problems and Prospects

Rapporteur: Mr R LINKOHR

OR:DE

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By letter of 15 October 1980 the Committee on Energy and Research requested authorization to draw up a report on the Common Research Policy: problems and prospects.

At its meeting of 30 October 1980 the enlarged Bureau authorized the committee to draw up a report on this matter.

The committee appointed Mr LINKOHR rapporteur on 25 November 1980.

On 18 September 1980 a motion for a resolution on the setting up of a special secretariat to sponsor Community energy research in Denmark was tabled by Mrs GROES and others pursuant to Rule 25 of the then Rules of Procedure (Doc. 1-406/80). On 19 September 1980 the European Parliament referred this motion for a resolution to the Committee on Energy and Research.

On 19 February 1981 the committee appointed Mr MORELAND rapporteur.

It considered the draft report at its meeting of 28 October 1981 and decided, on a proposal by the rapporteur, to continue its consideration of the motion for a resolution within the framework of its own-initiative report on the Common Research Policy: problems and prospects. Mr MORELAND was relieved of his duties as rapporteur.

On 11 March 1982 Mrs THEOBALD-PAOLI tabled a motion for a resolution pursuant to Rule 47 of the Rules of Procedure on setting up a European Federation of Institutes of Experimental Biology (Doc. 1-13/82). On 11 March 1982 the European Parliament referred to the motion for a resolution to the Committee on Energy and Research.

On 26 March 1982 the committee decided to consider the motion for a resolution within the framework of its own-initiative report on the Common Research Policy: problems and prospects.

At its meetings of 3 December 1981, 30 April 1982 and 24 June 1982, the Committee considered the draft report and on 24 September 1982 adopted the motion for a resolution and explanatory statement by 21 votes to 1.

The following took part in the vote: Mrs Walz, chairman; Mr Seligman, vice-chairman; Mr Linkohr, rapporteur; Mr Adam, Mr Bonaccini (deputizing for Mr Ippolito), Mr Galvez, (deputizing for Mr Pintat), Mr Fuchs, Mr Ghergo (deputizing for Mr Sassano), Mr Herman (deputizing for Mr Salzer), Mr Markopoulos, Mr Moreland, Mr Muller-Hermann, Mr Normanton, Mr Pedini, Mr Petersen, Mrs Pruvot (deputizing for Mr Galland), Mr Protopapadakis, Mr Purvis, Mr Rinsche, Sir Peter Vannech Mr Veronesi and Mrs Viehoff (deputizing for Mrs Lizin).

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A.

The Committee on Energy and Research hereby submits to the European Parliament the following motion for a resolution, together with explanatory statement:

MOTION FOR A RESOLUTION

on the Common Research Policy: problems and prospects

The European Parliament,

A. having regard to the motion for a resolution by Mrs GROES and others (Doc. 1-406/80),

B. having regard to the motion for a resolution by Mrs THEOBALD-PAOLI (Doc. 1-13/82),

C. having regard to the study by the Economic and Social Committee of the goals and priorities of a common research and development policy (CES 1033/81)

D. believing that the abilities of the Community's scientists and engineers should be harnessed more effectively for the acquisition of new technologies

E. having regard to the report of the Committee on Energy and Research (Doc.1-654/82),

1. Notes that Community research expenditure accounts for only about 1.5% of all public research expenditure in the European Community;

2. Notes further that only 1.8% of the Community budget is devoted to research expenditure;

3. Considers that the sharp increase in real terms in the cost of research creates considerable budgetary problems for the Member States and, to a lesser extent, for the Community too;

4. Recognizes the industrial and technological challenge by the USA and Japan as endangering the competitiveness of the European Community; is convinced that this danger can only be overcome by a considerably increased and more efficient commitment within Europe in terms of research and technology and draws attention to the greater proportion of gross domestic product spent on research in these two countries which is substantially higher than that spent in Member States of the Community.

5. Notes that technological dependence makes the European Community open to blackmail and exposes its trade and industrial policy to outside influences, as recently happened as a result of the US technological embargo;

6. Urges therefore that the European Community should have an independent research and industrial strategy;

7. Regards research policy as an important potential means of adapting to the transformation of society brought about by technological change;

8. Concludes therefore that the time is now ripe for a fundamental restructuring of research policy in Europe;

Priorities of a future European research policy

9. Therefore considers a fundamental reallocation of national and European programmes to be necessary in order to make better use of scarce resources;

10. Advocates extensive reductions in the research bureaucracy by transferring small-scale programmes making high administrative demands to the lower levels. Where small-scale programmes are shown to have a catalytic effect they should be continued subject to careful control;

11. Expects as great a reduction as possible, whilst being objectively justified, in the inflated advisory services of the Commission and the Council and requests the Commission to submit to the European Parliament within one year proposals for simplification of the advisory services;

12. Urges that large-scale research be put on a European footing since this will permit the consolidation of research and financing potential and ensure in an efficient manner that the results of research are disseminated widely with financing being borne jointly by all the Member States;

13. Expects and supports an extension of research-policy activities of the European Community beyond the field of applied research to that of basic research in subjects directly connected with the Community's objectives and requirements;

14. Considers the following fundamental aspects of agricultural research which has hitherto been underdeveloped in comparison with the Community's powers in the agricultural sector, as an important and legally viable means of intensifying applied research:

- further improvements in the quality of foodstuffs,
- reduction of the environmental impact by further developments in integrated plant protection,
- reduction of energy consumption in agriculture by such means as recycling and the development of biological nitrogen fixation techniques,
- research into and prevention of animal diseases,
- recognition of the role of nutritional science, also as a subject taught in universities, in the protection of consumers,
- study of the soil, with special attention to barren regions,
- genetic studies in relation to agriculture.

15. Recalls that agricultural research may greatly help to:

- reduce the dependence of Europe by decreasing its deficits in certain sectors (such as proteins, oils, tobacco, mutton and lamb, wood and so forth);
- reduce surpluses by enabling them to be processed;
- revitalize insufficiently developed regions in which projects are clearly of necessity a priority (such as the Mediterranean regions and Ireland);

16. Considers it essential, if European industry is to survive in competition with industries in the rest of the world, for a development and research policy to be an integral part of the Community's economic and industrial policy.

17. Recognizes microelectronics and informatics, maritime exploration, space and aeronautics, transport, biotechnology and energy as especially dynamic areas of research of fundamental importance for technological development in European industry; hopes therefore that pilot projects will be set up, around which to coordinate, as far as possible, national research;

18. Requests a purposeful assessment of the applicability to everyday life of the results of military research;

19. Considers that even in the short term promising opportunities for cooperation in European industry are to be found at the pre-competitive stage; and believes that, particularly at that stage, it is useful to encourage the establishment

of the Community undertakings referred to in Article 45 of the EAEC Treaty;

20. Expects that this cooperation and the activities of the European public research organization will lead to the establishment of a European 'scientific area' and better integration of national programmes, if possible, towards Community objectives;

21. Calls, to the same end, for increased mobility of researchers through large-scale further education and study programmes and incentives; in this connection care must be taken not to neglect the problem of social security;

22. Calls on researchers to make active use of the opportunities which already exist within European exchange programmes;

23. Stresses the need for coordination of private and public research objectives with priority being given to the choice of policy at European level;

24. Considers that when new research objectives are being established and steps taken to implement them, researchers must perform an advisory function;

25. Regards questions of nuclear, biological and chemical safety, which by their very nature assume a trans-frontier dimension, as manifestly constituting an area where research should be organized at European level;

Tasks of the Joint Research Centre

26. Urges that the next multi-annual programme for the Joint Research Centre (JRC) should be used to make is specifically qualified as a research centre for safety in high-risk industrial activities in the nuclear, chemical and biological sectors;

27. Recommends that the most import research sectors should be identified and determined and that the funds of the centres which are most advanced in those sectors should be increased as a result;

28. Calls for financing of the high flux reactor at Petten to be secured beyond 1984;

29. Welcomes the progress made by the JRC in the production of hydrogen using a thermo-chemical circuit and insists that a larger demonstration plant be constructed at ISPRA as soon as possible;

30. Calls for the continuous provision of unrefined information on the progress of work on the Super Sara project so as to assess the effectiveness of the Commission's work and reserves the right to take its findings into account in the annual budgetary procedure;

31. Recognizes coordination and amplification of national research as a further activity of the JRC, which should set up representations at national research establishments for that purpose;

32. Recommends the exchange of personnel between national research establishments and the Joint Research Centre;

33. Considers it essential to organize this research as a technological advisory service that will also address itself to the need to overcome the cultural difficulties of technology transfers, and will help with the timely preparation of Lome III, having regard to the European Community's special responsibility to the ACP-States;

34. Insists that research in the interests of the Third World should be conducted on the spot, provided this is practical having regard to the nature of the programmes and, if appropriate, in addition by coordination and liaison between national universities and research centres;

35. Advocates with immediate effect the highest possible organizational autonomy for the JRC, which should not only have a coordinating role in specialized fields, but be competitive with other research institutions and be given such international liaison authority as may be necessary;

36. Expects the Commission to submit the next multi-annual research programme before the end of 1982 so as to leave sufficient time for consultation;

Responsibilities of the European Parliament

37. Undertakes, should the next multiannual research programme be submitted late, to take the initiative itself before the end of 1982;

38. Calls for the joint monitoring of European research activities by its Budgetary Control Committee and Committee on Energy and Research to be stepped up, and stresses the vital importance of this function, especially in areas of high-cost research, such as JET;

39. Advocates regular contacts with the staff of European research establishments;

40. Expects its delegations - in particular those to the USA, Japan, Canada, India and Latin America - to appoint rapporteurs on research matters who will hold regular exchanges with the relevant specialist committee;

Requests to the Commission

41. Calls on the Commission to supplement its previous efforts by bringout out an overall report, to be updated at regular intervals, on the research policy of the major industrial world groupings (USA, USSR, Japan, EEC), so as to improve the basis of assessment and the potential for correction and anticipation in evaluating its own research policy;

42. Requests the Commission to limit administrative expenditure on research and development projects to the amount strictly necessary;

43. Calls on the Commission to include investigation of the social impact of technology in the industrialized countries as one of the research objectives of the Community;

44. Requests, for this purpose, and to strengthen the potential scientific community, an improvement in the dialogue between scientists, and between science and the lay public, and recommends a cheap edition of a 'European research handbook' as an important contribution to this end;

45. Calls on the Commission to adjust Community research, having regard to horizontal policy areas (regional policy, small and medium-sized undertakings, Third World), in order to help eliminate existing divergencies (and prevent large-scale industry from deriving any unfair advantage);

46. Rejects the creation of new Community research centres, but is in favour of cooperation agreements between the Commission and existing national research establishments. These should include the identification of key areas in specific fields of research to facilitate the division of work. Account should be taken of experience and specific geographical factors;

47. Expects the Commission to take steps to involve itself in the shaping of external scientific relations of the Member States, and to coordinate and guide them;

48. Insists on a Treaty amendment that will break with the existing ad-hoc basis and anchor research policy firmly in the EEC Treaty with clear allocation of responsibilities;

49. Expects in this connection that the role of the European Parliament as an institution of political decision-making and control will be clearly defined so as to remove Community research from an area where Parliament has no effective influence and to endow it with the necessary legitimation;

50. Calls on the Commission to submit the relevant proposals for the amendment of the Treaties, pursuant to Article 236 of the EEC Treaty, Article 204 of the EURATOM Treaty and Article 96 of the ECSC Treaty;

Requests to the Council and the Member States

51. Calls on the Council, as part of the joint budgetary authority, to approve the re-allocation of budgetary appropriations within the Community budget in favour of research;

52. Calls on the Member States to increase their research efforts to at least 2.5% of their gross domestic product;

53. Calls on Member States to ensure that scientific experts, users of research and industrial representatives are more directly involved than national civil servants in representing the Community's interest in research matters;

54. Believes that each President of the Council of Research Ministers should visit the sites of the Joint Research Centre during his period of office;

55. Believes that the Council of Research Ministers should meet more frequently and spend more time developing Community research policy and the coordination of Member States' policies instead of devoting its agenda to ad hoc research programmes.

56. Calls on the Member States to coordinate their research more closely and to pool selected projects at European level so as to save money and improve the efficiency of research;

Forwarding instructions

57. Instructs its President to forward this resolution to the Commission and Council, and to the parliaments and governments of the Member States.

B

EXPLANATORY STATEMENT

The Common Research Policy - problems and prospects

I. Introduction - The triple challenge

1. European research policy faces three major challenges in the early 80's.

- the dramatic rise in the cost of research exacerbates the budgetary problems in the national states and the Community. Economies will have to be made by redistributing national and European responsibilities for research. This report recommends that the major research projects, both in basic and applied research, should be largely transferred to the European level.

- Europe must develop ways of dealing with the industrial challenge from the USA and Japan. Research must play a part in this. The Japanese and Americans are ahead not so much in terms of basic and applied research as in their ability to channel research findings into the industrial process as part of an integrated industrial strategy. Since research has become a tool for modernizing our economy in many areas, we cannot allow research to be conducted at the European level in some areas while production and marketing in general remain nationally organized. Hence the proposal that a European industrial strategy should evolve from a European innovation policy. Europe must take advantage of the size of its markets. A European industrial strategy would not necessarily exclude cooperation with the USA and Japan.

- Research policy must not be regarded as a mere business tool. Research findings need to be viewed in their social, economic and structural context. We often lose sight of the fact that we are experiencing a period of exciting discoveries in the history of science which point to new approaches in thinking. Recognition of the finite nature of natural resources and scientific insights have shown that mankind cannot manipulate nature at will. Man is part of nature. This gives rise to a new view not only of physics but also of the behaviour of social systems. Europe is on the threshold of a secular cultural upheaval. It is not enough to respond to this challenge by, say, posing the question 'nuclear energy: yes or no?'; an adequate response can only be achieved within given economic limitations. The European Community must bear its full share of responsibility here.

These three challenges mean that European research policy must be prepared to adopt a fundamentally new approach. Although this approach will be based on what has gone before some adjustments will be necessary.

2. The following considerations and conclusions relate to the research policy of the Community and its Member States. The subject of this study is the future division of labour between national and Community research. Particular attention is given to the severe financial constraints which now apply.

3. The report is confined to public research expenditure. The rapporteur is however aware that private firms too are playing a considerable part in research and development projects. The firms are mainly interested in market-linked developments. But the large companies are increasingly also conducting basic research and thus have a major influence on the progress of scientific discoveries. Consequently, a separate study might usefully consider and evaluate that portion of European research which is conducted by private bodies.

4. The basic research conducted by the large companies mainly takes place in the fields of information science, electronics, chemistry and energy. The multinational oil companies play a special role and are in the process of using their huge profits to transform themselves step by step from vertically organized oil groups to horizontally integrated energy companies. This increases their influence over international events. Because of their international activities, the multinational companies are also gaining a growing influence over technoligcal developments in the less industrialized countries.

5. If the European Parliament is to concern itself with European research policy, it is important to stress and investigate particularly those aspects which fall within or should fall within the Community's sphere of responsibility. This report is no substitute for any of the detailed studies of European research policy nor is this its aim. Instead it seeks to provide a sober analysis as the basis for practical proposals on the future form of Community research policies.

6. Research policy moves within a given socio-political framework, and public debate on it ranges between two extremes:

- either the State simply establishes the basic parameters and subsequently encourages research by means of tax incentives
- or research policy is seen as an instrument of structural policy and controlled by direct financial transfers.

At the European level this controversy virtually disappears as the Community is unable to provide tax incentives. European research policy is therefore conducted with direct financial encouragement by the Community. Such control is however only possible on an ad hoc basis. As a result the allocation of research resources is generally not subject to intra- Community competition, despite the use of tendering procedures. Perhaps the Commission's ability to control this

process has been overestimated. Particularly in the case of indirect promotion of programmes, a major degree of decentralization to national or regional public authorities would generally be preferable.

7. Research represents man's intellectual confrontation with his own nature, and that of the outside world. This relationship between man and nature has left a very deep mark on European cultural history. It crops up again in the debates on the ecological movement and the movement away from linear progress. Although this debate is not new, it is currently dominating public discussion probably more than ever in the past. No European research policy which does not simply take the technocratic view but seeks to contribute to cultural history, (which, of course, it always does in one way or another), can evade this issue. Nor can the debate be reduced to a matter of technology assessment.

8. Science has lasting effects on culture, the economy, society and education. And conversely the general direction, scale and assessment of scientific activity are determined by our own systems of values and financial capacity. The more we become aware of this reciprocal relationship, the more clearly defined is the desire to promote orderly interaction between science and society. We need scientific discoveries to understand the totality of our existence, but at the same time we do not wish to be shackled by scientific constraints. Scientific activity should therefore be based on an exchange between the general public and those engaged in scientific activity in the more restricted sense. It should be transparent and open to inquiry and criticism and scientists themselves should have more say in the shaping of research policy.

9. We are not only facing new technological challenges, but are also experiencing a profound cultural crisis. Concepts and values upon which our society has been based for centuries have been brought into question or made obsolete by reality. The natural sciences have played a major part in this process, but without being able to offer new values and patterns of behaviour. Nor, of course is this the task of science, at least in its strictest sense, but we nonetheless have an obligation to reflect on the crisis in our culture. European research and scientific policy must therefore include the totality of our existence in its considerations. Far more importance should be attached to the social sciences and humanities than in the past. In the long term, Community research will also have to embrace this field.

10. European culture, in particular the scientific and technological civilization of Europe, has had a lasting influence on the cultures of other continents. It was from Europe that the exact sciences, and in their wake the technological society based on a division of labour, started their triumphal progress round the world. To a certain extent this was also true of the philosophy of the world which went with them. Concepts such as the nation,

democracy and socialism were absorbed by other cultures and given concrete form. But we are now finding that the non-European nations are having tremendous difficulties in applying these concepts to their circumstances and integrating them into their traditional systems of values. Counter-movements have emerged resulting in aggression and incomprehension. Islamic fundamentalism is only one, albeit perhaps the most obvious, form of resistance to European culture. At the same time we Europeans too are searching for a new identity. But we can only find a role in the world in interaction and solidarity with other cultures. Surely the European Community is the ideal institution to assist in this search for our cultural role in the world, to pose the questions and supply the answers. The Community should not simply become an instrument for industrial self-assertion but should seize the initiative in tackling the greatest challenge to civilization in our history. Perhaps people in Europe are so unenthusiastic about the Community precisely because it has failed to act in the sphere of cultural policy. Anguished questions are being asked about the ethical integration of technology and no answers are being given.

11. In every country of the Community there is a growing desire to comprehend technology in terms of human nature. Profound fears have been generated by the opportunities presented by discoveries in nuclear physics, military technology, information technology and genetic engineering. We are all confronted by more than a philosophical problem; we have become aware of the boundaries of our planet, and have observed that not only our intellectual life but also our very existence, our food and health depend on how we cope with technology.

It is no longer enough to recognize all the potential uses of technology; we need to reflect on the function, relative importance and impact of technology. Here too the Community has obligations which it cannot escape. We need an ongoing, structured dialogue on the technological civilization. This also applies to technology transfer to the Third World. In the context of development policy we need information on the socio-cultural impact of various development strategies.

II. Basic parameters: Member States' spending and their approach to Community research

12. In 1979, in the Community of Nine, public research expenditure totalled 16,700 million EUA[1], at current prices, and in 1980 19,400 million EUA. The annual average growth rate in real terms between 1970 and 1979 was just 0.5%. West Germany, the Netherlands and Ireland had a higher rate of growth and in France, Italy and the United Kingdom it was lower.

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[1] Statistics supplied by CRONOS

Community research amounted in 1980 to 284 m EUA; in other words the Community share of total public research expenditure (EUR 9) was only about 1.5%. In some areas of research, however, it was far higher, which simply reflects the concentration of Community resources on a few areas of research.

13. A further problem is low utilization of appropriations by comparison with the levels of allocations in the budget for Community research:

TABLE I

Original budget allocation in payment appropriations (only Chapters 33 and 73)	of which carried forward	lapsed this year
1974	84 m EUA	14 m EUA	3 m EUA
1975	96 m EUA	22 m EUA	1.5 m EUA
1976	135 m EUA	33 m EUA	18 m EUA
1977	183 m EUA	70 m EUA	7 m EUA
1978	194 m EUA	100 m EUA	25 m EUA
1979	196 m EUA	76 m EUA	16 m EUA
1980	277 m EUA	110 m EUA	0.6 m EUA

14. The breakdown of public research appropriations in the Member States by individual sectors is shown in the following table:

TABLE II

Total expenditure by EUR 9 grouped according to objectives in %

	Chapter	1970	1975	1979	1980
1	Study and utilization of natural environment	1.6	1.8	2.3	2.3
2	Organization of human environment	2.7	3.1	3.5	3.4
3	Protection and improvement of human health	2.9	4.3	5.7	5.5
4	Production, distribution and rational use of energy	10.3	9.3	10.7	10.8
5	Agricultural productivity and technology	3.1	3.6	3.7	3.5
6	Industrial productivity and technology	11.3	10.6	8.5	8.6
7	Problems of social coexistence	1.9	3.0	3.0	2.8
8	Space research and exploitation	4.3	4.3	4.1	4.0
10	General promotion of research	36.2	37.5	33.9	32.3
	Total expenditure for non-military R & D	74.1	77.5	75.1	73.6
9	Defence	25.9	22.2	24.4	26.4
	Miscellaneous	-0.2	0.3	0.2	0.2
	Total R & D expenditure	100.0	100.0	100.0	100.0

Source: CREST/1233/80

This shows that:

- the proportion accounted for by military research is rising again
- research with industrial objectives is losing ground.

15. Over 80% of the Community's research expenditure is accounted for by three countries - West Germany, France and the United Kingdom. The remaining 20% is mainly accounted for by Italy and the Netherlands (see table)

TABLE III

Public R & D expenditure

	1979 figures at the then current prices and exchange rates (in m EUA)		1980 figures at the then current prices and exchange rates (in m EUA)	
	total	non-military	total	non-military
F. R. Germany	6308	5572	6753	6068
France	4542	2938	5299	3365
Italy	923	895	1303	1268
Holland	1049	1017	1125	1090
Belgium	469	467	520	518
United Kingdom	3135	1459	4139	1894
Ireland	57	57	61	61
Denmark	243	242	217	216
EUR 9	16726	12646	19417	14480
European Communities	238	238	284	284

TABLE IV

	Annual rates of change for totals at 1975 prices and exchange rates (in %)							
	70-73	73-77	77-79	70-79	70-73	73-77	77-79	70-79
	total				non-military			
F. R. Germany	10.0	-3.5	6.1	2.9	12.4	-3.7	6.6	3.7
France	1.8	-2.8	3.7	0.1	-0.2	-2.0	0.2	-1.0
Italy	-1.5	-1.4	4.8	-1.4	-1.7	-1.2	5.5	-1.4
Holland	1,2	1,7	0.9	1.2	3.8	1.9	0.5	2.2
Belgium*	1.5	-1.8	(-9.9)	(-2.9)	1.6	1.9	(-9.9)	(-2.9)
United Kingdom	1.6	-1.6	-2.0	-0.7	0.7	-3.2	-5.7	-2.8
Ireland	10.0	3.3	7.2	6.2	10.0	3.0	7.2	6.2
Denmark	5.4	-0.4	-3.2	0.8	5.4	-0.6	-3.1	0.8
EUR 9	4.0	-3.4	3.5	0.5	4.3	-2.3	1.6	0.9
European Communities	-5.5	17.7	-1.0	5.3	-5.5	17.7	-1.0	5.3

*The figures in brackets take account of the methodological adjustments made in 1978

16. Military research accounts for approximately a quarter of total research spending. In the United Kingdom it accounts for over half.

TABLE V

Defence expenditure as % of total research expenditure

Country	1970[1]	1975	1979	1980
United Kingdom	41.0	46.4	53.5	54.2
France	35.9	29.8	35.3	36.5
F. R. Germany	17.7	11.0	11.7	10.1
EUR 9	25.9	22.2	24.4	26.4
[1] estimated				

Even if research in the defence sector has spin-offs in other areas, it is nonetheless true that the Community of Nine is neglecting non-military research to the benefit of military research. It is particularly important to consider whether military research is likely to be pursued even more intensively in future given the general deterioration in relations between the major powers. In the rapporteurs view any growth in the level of military research is to be deplored.

17. If we compare the Community with the United States and Japan, the following picture emerges:

	total non-military research spending divided by GDP	public non-military research spending divided by GDP
Community	1.7	0.7
USA	1.7	0.5
Japan	2.0	0.8

Thus Japan for example invests 10 to 15% more in non-military research than the Community (relative to its GDP).

18. The breakdown of research spending by the Member States of the Nine according to objectives is as follows:

(see table on next page)

This shows that expenditure on energy research in the Community represents approximately 40% of the expenditure on research into defence.

TABLE VI

Breakdown by objectives - 1970[1] to 1980

(in %)

	D		F		I		NL		B		UK		IRL		DK		EUR 9	
	1970	1980	1970	1980	1970	1980	1970	1980	1970	1980	1970	1980	1970	1980	1970	1980	1970	1980
1 Study and utilization of natural environment	1.7	2.8	2.5	3.0	1.5	2.1	1.3	0.9	3.4	3.7	0.3	0.9	1.5	0.9	1.7	3.1	1.6	2.3
2 Organization of human environment	1.0	3.6	3.9	4.1	2.8	1.2	3.9	5.7	1.2	3.4	2.6	1.7	6.6	7.3	2.6	3.0	2.7	3.3
3 Protection and improvement of human health	2.4	6.1	4.2	5.5	3.0	5.4	6.7	6.2	6.5	15.9	1.8	2.5	5.3	10.5	6.7	13.5	2.9	5.5
4 Production, distribution and rational use of energy	11.3	14.4	8.3	7.5	21.7	22.9	6.2	4.4	13.0	8.7	7.2	6.7	0.2	1.0	2.6	7.7	10.3	10.6
5 Agricultural productivity and technology	2.1	1.9	3.0	3.9	3.2	4.1	8.7	8.4	4.2	4.8	2.6	4.1	55.4	25.7	11.9	8.8	3.1	3.7
6 Industrial productivity and technology	6.6	10.0	15.2	9.3	17.1	17.4	6.4	6.2	9.9	14.9	16.0	6.2	18.1	6.1	8.1	13.6	11.3	9.4
7 Problems of social coexistence	2.7	3.8	1.8	1.3	0.8	2.2	4.2	5.5	6.0	11.1	0.6	1.1	3.8	10.2	3.9	7.9	1.9	2.8
8 Space research and exploitation	5.3	4.3	6.3	6.2	4.5	6.2	3.1	3.2	3.9	5.6	1.9	2.1	0.0	0.9	2.3	3.6	4.3	4.4
9 Defence	17.7	10.1	31.8	36.5	3.9	2.7	4.9	3.1	0.4	0.3	41.0	54.2	0.0	0.0	0.3	0.3	25.9	25.4
10 General promotion of research	49.2	43.1	22.7	22.2	41.6	35.7	54.0	55.8	51.4	31.8	25.6	20.5	9.1	37.3	59.8	39.1	36.2	32.0
TOTAL EXPENDITURE	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
of which non-military R & D expenditure	82.3	89.9	68.2	63.5	96.1	97.3	95.1	96.8	99.6	99.7	59.0	45.8	100.0	100.0	99.7	99.7	74.1	74.6

[1] Rounding up and the omission of a small number of non-classifiable miscellaneous items may mean that the proportions do not total 100%

Source: Statistical Office of the European Community

19. Closer inspection of, for example, public energy research (production, distribution and rational use of energy) reveals the following:

Energy research as proportion of total research (military and non-military)

TABLE VII

	1975	1979	1980
EUR 9	9.3	10.7	+
EUR 9 + Community institutions	9.9	11.4	+
United States	6.2	11.7	-

Consideration of energy research as a proportion of non-military research alone shows:

Energy research as a proportion of non-military research

TABLE VIII

	1975	1979	1980
EUR 9	11.9	14.1	+
EUR 9 + Community institutions	12.6	15.1	+
United States	12.7	23.0	-

20. Proportionally, therefore more support is given to energy research in the United States than in the Community.

The distribution of resources to individual sectors is a further interesting aspect of energy research in all Member States of the Community:

TABLE IX

	1975	1979
General research	1.2	3.9
Non-nuclear primary energy products	3.5	8.8
Fuels and nuclear transformation	82.3	74.4
Other sources of energy	0.4	2.6
Energy-saving	0.3	0.8
Miscellaneous	12.3	9.5
Total	100.	100.

This shows that the nuclear sector continues to enjoy priority over other sectors. If one were to consider the major countries (West Germany, France, the United Kingdom and Italy) and Belgium in isolation, the nuclear bias in energy research would be even more pronounced.

21. It is perhaps useful to compare these figures with those for the USA:

TABLE X

	1975	1979
Nuclear energy	50.1	38.2
Fossil energy	26.5	22.1
Solar energy and geothermal energy	7.0	16.4
Energy-saving	4.4	13.3
Miscellaneous	12.0	10.0
Total	100.	100.

Many will no doubt be surprised that non-nuclear sources of energy and energy-saving measures are promoted to a greater extent in the USA than in the Community. (Statistics for changes under the Reagan administration are not yet available.) Nevertheless it is important to note that despite differences in emphasis and level of resources, research expenditure in Japan, the USA and the Community does not by and large vary a great deal. Closer inspection, however, shows that, as described above, there are major differences between Member States in the Community.

Four far more important reasons for the difference between the USA and Japan on the one hand and the Community on the other are, however, as follows: in Europe

- there is no common language and culture
- there is no common education policy
- there are differences in the aid given to research
- there is a lack of mobility among researchers, i.e. there are barely any European research teams.

22. The Community's research resources amount to a mere 1.5% of total public R & D expenditure in the Community[1]. While there was a clear increase on average each year between 1973 and 1980, the figure dropped in 1980-1981. It will rise again in 1982, but only as a result of the expenditure on fusion research.

TABLE XI

Payment appropriations for R & D in the Community budget from 1973 to 1982[2]

1973	75m	EUA
1974	84m	EUA
1975	101m	EUA
1976	135m	EUA
1977	183m	EUA
1978	195m	EUA
1979	196m	EUA
1980	277m	EUA
1981	249m	EUA
1982	338m	EUA

[1] COM (81) 574 final
[2] PE 74.083/Add.4

The drop in 1981 and expenditure problems in general are partly due to the delays in decision-making by the Council of Ministers. Indirect actions in particular have been held up.

23. The main areas affected by the decline in total research expenditure in the Member States are, as shown in the table on page 17 , the goals of industrial productivity and technology and general promotion of research. The most marked increases on the other hand are in the areas of protection and improvement of human health, organization of the human environment and the study and use of raw materials.

24. On average 8% of national public research funds are used for international cooperation. The totals vary between 5 and 10% according to Member State. The larger countries in the Community tend to prefer bilateral agreements whereas the small Member States prefer multilateral cooperation. Despite somewhat heavier administrative costs, several factors operate in favour of multilateral cooperation, including:

- wider distribution of acquired knowledge,
- improved financial structuring owing to consolidation of budgetary appropriations,
- best possible use of available research potential.

Four areas of research also enjoy priority in multilateral cooperation: defence, space, general promotion of research, and industrial technology.

25. All these statistics can only serve as a general guide to state efforts in the individual sectors because the demarcation between the individual types of research expenditure varies somewhat from country to country.

This presentation of research expenditure is, however, also distorted because it only shows state activities. Thus, for example, in West Germany a major part of non-nuclear research is conducted by industry whereas in France and the United Kingdom it is financed from public funds. But if the major proportion of European research is conducted by industry (over two-thirds in West Germany), then we are entitled to ask how this research capacity can be harnessed to the goals of Community policy.

III. Research policy as a means of changing economic structures

26. Nevertheless these figures do show the shifts in the priorities and policies objectives of the individual governments. There is as yet no 'European' research policy just as there is no 'European' industrial policy. Nevertheless the development of individual national policies does indicate some general trends and aims.

R & D policy is not traditionally an instrument of national structural policy. It has only become so in the last forty years as a result of technological/scientific changes. Since the post-Second World War period, the following phases can be identified:

until the middle of the 50s	:	wholesale expansion in the sciences and higher education policy
from 1955 to 1965	:	great expansion of private innovation to remain competitive. Creation of major research institutes. In some cases creation of research ministries
from the middle of the 60s	:	elimination of technological lacunae vis-à-vis the United States by backing up conventional support areas (nuclear research, space travel, military research) with data-processing and 'new technologies'. Introduction of indirect aid on a larger scale.
since the beginning of the 70s	:	structural policy approach to overcome increasing signs of economic crisis
at the beginning of the 80s	:	increasing financial constraints on public budgets. Concentration of R&D activities on modernization of economy and reducing dependence on energy imports. Greater pressure towards international cooperation.

27. This development reflects, as mentioned above, the social parameters and political objectives. Research policy has become a significant instrument of national economic and industrial policy. Logically, therefore, European research policy should become an instrument of future European economic and industrial policy but this has still not happened.

In the past, the governments of the Member States were extremely reluctant to have anything to do with a common research and innovation policy. The larger Member States in particular showed little interest in releasing their national hold on research policy. The smaller countries on the other hand are more inclined to favour the extension of Community research since it enables them to increase their own potential.

28. It is also striking in the analysis of individual projects that the proportion of nuclear research in Community research is between 70 and 80%, i.e. extraordinarily high. This proportion is no doubt historically

determined by the Euratom Treaty but it is impossible to rid oneself entirely of the impression that the Member States transfer to the European level projects which attract little public interest at any given time in order to be able to promote other projects at national level to impress the national electorate. Equally astonishing is the fact that agricultural research is the poor relation of Community research, and will clearly remain so, the Community's Common Agricultural Policy notwithstanding.

The question now arises as to whether factors have emerged which would justify a new approach to a European research policy. The shortage of funds and the economic, technological and cultural challenges facing Europe should have made it clear that it is absolutely essential to reorganize European research and innovation policy.

The chronological summaries above shows that research policy is well able to adapt to shifts in the basic parameters. We must therefore ask ourselves whether there are new factors which, notwithstanding the new financial constraints, would justify extending Community research policy so that we can tackle the common problems on a united basis.

IV. Legal bases for a Common Research Policy

29. The Treaties establishing the European Communities contain very few provisions relating to research policy. Article 55 of the ECSC Treaty provides for European research in the field of coal and steel, the Euratom Treaty contains comprehensive provisions on nuclear research in Europe. For example, Article 8 of the EAEC Treaty is the legal basis for the 'Joint Nuclear Research Centre'. This was redesignated the 'Joint Research Centre' some time ago because it had extended its area of research to the non-nuclear sphere. And finally the EEC Treaty contains only one reference to research in Article 41 relating to agriculture. No explicit provision was made in the Treaties for further research activities.

Since 1966 the European Parliament has been calling in ever more urgent terms for the creation of other research programmes. It was first assumed that the best solution for creating a legal basis would be to apply the procedure for amending the Treaties pursuant to Article 236 of the EEC Treaty. Article 235 was only to be applied in as a last resort.

30. There have been signs of a certain willingness on the part of the Council since 1967 and also among the Heads of State of Government since the summit meetings in The Hague in 1969 to extend research activities at European level.

These political developments need to be seen in the context of the threat to the continued existence of the JRC. The survival of this institution was in no small measure due to the constant pressure from the European Parliament throughout that period.

31. Even as late as 1972 it was apparent that the Council was seeking to avoid the application of Article 235 of the EEC Treaty as a legal basis for a general research policy. Indeed it went so far as to adopt, through the permanent representatives acting as 'the representatives of the Member States meeting in the Council', a resolution on the implementation of action in the non-nuclear field. This thus represented a resolution under international law and not a Community decision. This resolution called for the conclusion of a treaty between the governments in the Member States and the JRC to allow non-nuclear research. Parliament strongly criticised this procedure at the time.

At the Paris 1972 Summit, there was once again a declaration of the intention to encourage the development of a common policy in the field of science and technology. This statement was reaffirmed at the 1973 Copenhagen Summit. The next step by the Council in 1974 was the adoption of four resolutions relating to research which all cite the Community Treaties as a legal basis without referring to any specific article. The final breakthrough then came in the same year, 1974, with the adoption of Article 235 of the EEC Treaty as a legal basis for the adoption of the implementing regulations to the abovementioned four resolutions. A major amount of the credit for this breakthrough is due to the Commissioner responsible at the time, Mr Dahrendorf, who received full backing from Parliament. Since then it has become standard practice to invoke Article 235 of the EEC Treaty when introducing new research programmes. This represents an institutional problem which ultimately affects the European Parliament's terms of reference:

32. The Community's Treaties may be regarded as the Community's constitution. But the Community constituon is subject to certain changes, above and beyond the procedures for amending the Treaties, in the sphere of Community case law. The latter contributes to the substantive Community constitution. This particularly applies in cases in which the basic Community law does not contain substantive provisions but specifically accords powers to the Community institutions. The exercise of these powers automatically modifies the relationship between the Community and the Member States. To give a concrete example, if the Community makes use of its general powers under Article 235 of the EEC Treaty to assign hitherto undefined responsibilities, this transfers policy or other regulatory decisions to the Community. By virtue of the priority of Community law, this in fact imposes obligations which prevent the Member States from enacting regulations which deviate from Community law or from reaffirming these even at national level. As a result the substantive Community constitution is modified.

33. The European Parliament also endorsed the creation of research policy on the basis of Article 235 of the EEC Treaty

because it was convinced of the necessity for such a policy. The application of Article 235 of the EEC Treaty as a legal basis however, also raises a problem from the parliamentary point of view: amendments to the Treaties pursuant to Article 236 of the EEC Treaty require ratification by the Member States pursuant to their constitutional regulations, which includes approval by national parliaments. On the other hand, when Article 235 of the EEC Treaty is applied, which after all represents a substantive constitutional amendment, the only parliamentary element is the consultation of the European Parliament. Consequently, whereas under the procedure pursuant to Article 236 of the EEC Treaty one or more national parliaments have an opportunity to object to the policy proposed and to prevent it being implemented by withholding ratification of the amendment to the Treaty, when Article 235 of the same Treaty is applied, the European Parliament can express its disapproval but is unable to prevent the policy being introduced by the Community's legislative body, the Council. The joint research policy is an example of how European policy largely escapes parliamentary scrutiny (both national and European), and action is left to the Commission and the Council.

The effect of these institutional problems on the research sector is that the European Parliament must not only consider the substance of research policy but must also insist either that the procedure for amending the Treaties pursuant to Article 236 of the EEC Treaty be applied to introduce a research policy, or that it should be allowed to exercise parliamentary control similar to that of the national parliaments under the procedure for amending the Treaties.

V. Justification for Community research

34. There are two elements which justify a new approach to Community research policy:

- the continuing shortage of budget resources at national level
- the common internal and external challenges.

The budget situation is forcing national governments to reduce or limit expenditure on research. This is at any rate under discussion in the capitals of the Member States. There is therefore the purely economic question of whether greater cooperation and coordination can enable economies to be made without leading to any real loss. This could take the form of cooperation between states or research at Community level. Joint projects in basic research are feasible inasmuch as they relate to major projects (particle research, nuclear technology, lasers, marine technology, space research, Antarctic research etc). As an example we may cite various major projects which are coming up for decision in West Germany:

- further financing of fast breeder and high-temperature reactors (estimated additional finance requirement: one to two thousand million EUA)

- the spallation neutron source, i.e. a neutron source with high peak fluxes (costing approx. 200 mill. EUA)
- a relativistic heavy ion accelerator (costing approx. 90 mill. EUA) for the Gesellschaft für Schwerionenforschung (Heavy Ion Research Company) Darmstadt
- a proton-electron storage ring (HERA) for DESY, Hamburg (costs estimated at 250 mill. EUA)

Also the European Science Foundation (ESF) has recommended that a European synchrotron radiation source be built, which with premises and equipment is likely to cost 100 mill. EUA.

35. The Community should use its own instruments of legitimation - albeit they remain to be perfected - both in relation to the Member States and to other international organizations such as the OECD, ESA, CERN, EMBL, ESO, etc. in order gradually to assume the role of coordinator in such matters. Major installations could be built and used jointly. This would lead to the formation of European teams which in turn would have repercussions on the European industrial and research scene.

The electron synchrotron proposed by the ESF will serve as an example. Its scientific necessity can be taken as assured, given the ESF's recommendation. The most economical solution could be found at Community level or by following the example of CERN. Costs would be reduced and experience gained if the new electron synchrotron were connected to the existing German electron synchrotron plant (DESY) in Hamburg. This could provide both the necessary infrastructure and experience in dealing with synchrotron radiation, since the research teams there have already conducted research into synchrotron radiation in their own storage rings.

36. The second reason for a common research policy is to be found in the new challenges facing us. Internally we face problems resulting from a new wave of technology (risk assessment, social acceptability of technology, enviromental and safety problems, improvements to the work environment, new assessment of the concept of work). Externally we must safeguard our international competitiveness , use our energy and raw materials economically and cope with a range of problems relationg to technology transfer.

These problems need to be tackledjointly because they affect us all. If this is accepted as the criteria for European research policy, then clearly the present policy and views of the Council of Ministers are far removed from this goal. Neither the scale nor type of current research programmes represents an adequate response to these challenges. On the contrary, there is a danger of being overtaken by the Japanese or Americans not only in the field of microelectronics, but also biotechnology, marine technology etc. This would confirm the vague fears of those who are already predicting that the base of new technologies will shift from the European-Atlantic area to the Japanese/ American Pacific area. This would have unforeseeable consequences for Europe.

37. If we are to combat effectively the strategy of our major industrial competitors, we need new measures to offset their advantages (large domestic market, uniform education system, common objectives, etc.). Europe must develop a uniform strategy in matters of industrial competition. This must include not only more money for research but also better, i.e. more rational, use of existing resources.

All this is very much in line with the arguments put forward by the Commission in recent years. However we wish European research to be subject to direct supervision by the European Parliament. We also want more to be done to stimulate the key technologies of the future and we want Parliament to have a major say in all matters relating to nuclear, biological and chemical safety.

38. The research policy of the European Community is therefore justified on the following grounds:

- as a means of facing the external industrial challenge (marine technology, space technology, aerospace, biotechnology, information technology, new manufacturing processes, energy)

- as a means of overcoming internal problems (nuclear, biological, chemical safety)

- a division of labour on major projects (in both basic and applied research) to rationalize the use of resources

- in relations with the Third World (technology transfer, socio-cultural repercussions of scientific/technical innovation on ancient cultures)

- coordination and information (central role of the Community in determining a European research strategy, dissemination of scientific information).

39. Parliament must point out the consequences of failing to adopt a common strategy. The situation now is radically different from that in the 60's when national programmes were sufficient to catch up with the USA's lead in many fields. Nowadays we can only do this by working together because the individual fields of technology and science have become so wide that the national framework in Europe is too restricted. We should not forget that we have acquired a wealth of valuable experience in supranational cooperation in Europe. This applies not only to Community research in the narrower sense (e.g. fusion research) but also in space research, nuclear research, molecular biology and astronomy. For example CERN in Geneva will build a new electron-positron storage ring costing approximately 400 m EUA. This highlights the leading role of Europeans in high-energy physics. To clarify the picture, a brief description of the organizations engaged in international cooperation appears in the annex to this document.

40. National research nevertheless still has a role to play because it

- is more flexible and usually cheaper

- encourages competition (i.e. competition between national centres).

The Community should therefore quickly phase out all those programmes which involve unnecessary bureaucratization at the European level. There is really no need for a small programme of 20,000 EUA to be administered from Brussels. This should be controlled by the national authorities.

(This should not be confined to the COST projects managed from Brussels alone.)

VI. Necessary adjustments to European research policy

41. If we accept this argument, then further adjustments to European research policy are essential:

- we need to reorganize programmes. Small programmes should be transferred to the national level. Community research must concentrate on a few selected major areas. It can play an important executive role in other areas by providing coordination and information.

- where indirect programmes are still necessary, they should be located in small and medium-sized undertakings and always have the underlying object of creating European research teams. Any unfair advantage that might accrue to larger undertakings with a fully developed research department should be avoided. Larger undertakings should only have research programmes funded by the Community if it can be shown that research has been specifically requested by the Community and cannot be carried out without Community appropriations.

- the unfortunate terminology of the distinction between direct and indirect research should be dropped. It should be clear that the Community's own research is confined to the JRC. All other projects in which the Community participates are on the basis of coordination or concertation. This does not of course preclude financial aid from the Community to national research bodies under coordination programmes. On the contrary, it must be stressed that the Community will continue - indeed, will step up - its financial contribution in certain areas, in particular in the field of applied research. It is not withdrawal from applied research that is being called for but rather an enlargement of the entire research field to cover basic as well as applied research.

- the Commission should urge national governments to set up more technological consultancy agencies. The Community could help with coordination and advice. Under no circumstances, however, should it seek to sanction a lack of national activity by providing Community resources. It should confine itself to acting as a catalyst and coordinator.

- the transparency of the programmes and quality of Community research should be improved by assessing them in terms of international research standards and making comparisons. An Annual Directory of European research would be a useful way of comparing them with national and international research findings and projects particularly if it were to appear in a reasonably-priced edition.

- before any new programme is approved, the European Parliament should be given sufficient information on national programmes to enable it to form a reasonable opinion of the need for Community research programmes. It is not enough for the advisory programme committees to be given

this information. It would also be useful to see what contribution business can make to research and development. To this end, the Commission should publish a yearbook of European research.

42. In the 19th and 20th centuries, research and education policy formed the basis of regional industrialization. Growing industrialization needed a national domestic market with the appropriate transport network to enable goods to be sold. The situation has now changed and the domestic market needs to be bigger. But research and education are still a necessary basis of innovation, although they must take account of the larger market. Concentration of research on a few regions accompanied by a broadening of the market for industrial products leads to horizontal imbalances as we are finding to our cost in the Community. The Community makes the worst possible use of its human potential, or perhaps we should say resources.

Research is the precursor of industrial production. European research must therefore lead to European industries and European undertakings. Certain sectors are an obvious choice: aviation, space technology, marine technology, biotechnology, energy technology and information technology. Serious thought also needs to be given to how the European armaments industry can cooperate to reduce our dependence on the USA and also reduce the economic pressures to export arms.

43. If European industry is to safeguard an industrial base for Europeans, a start needs to be made in the research sphere. This step should be taken now and the European Parliament should encourage the Commission to reflect further on this aspect and put forward proposals for programmes.

The limits of cooperation initiated by the Community between European undertakings in the research field are set by competition. The rules on competition set out in Articles 85 ff of the EEC Treaty were conceived as a necessary corrective mechanism for a European Community based on the market economy. They are intended - at least in theory - to prevent the market from being undermined. Efforts to establish a joint research policy should not therefore call existing rules of competition into question. At all events, the potential of the pre-competitive stage is not at present being fully utilized.

44. One of the rapporteur's correspondents described the situation like this: Suppose there is a treasure hidden in the woods. We cannot go out together to look for it, but we can share a taxi to the edge of the woods, and then go our separate ways to look for the treasure. In concrete terms this means that areas of research at the pre-competitive stage in European industry (e.g. in the automobile sector) should be supported and expanded by the Community.

The Japanese model that is so often held up to Europeans as an example is only of limited relevance here. The application of the Japanese and their ability to convert the results of research into industrial

techniques should be admired and imitated. A barrier to the adoption of Japanese methods arises, however, in terms of the division of powers in democratic European societies, when - as happens in Japan - excessively close cooperation between all the undertakings concerned and the authorities becomes necessary for the attainment of industry-policy objectives.

45. The following phenomena are a further reason for criticism of research policy:

- programme-linked project aid favours large undertakings. Existing research policy (both national and European) is accelerating the economic and geographical concentration already taking place.

- research policy tends mainly to be geared to research which is already well-organized. Projects are usually only financed once someone is already working on them. Research policy therefore runs counter to regional planning and regional policies.

- research policy is widening the gap between North and South. Programmes for what are known as modified technologies are commendable but have hitherto had little effect on the development process.

46. Three questions arise:

- how can the innovatory potential of small and medium-sized as well as that of large undertakings be strengthened?

- how can the large undertakings' expertise be harnessed to policy goals for example in development or regional policy?

- what measures should be taken by public research aid to give national programmes a regional policy element? Is this at all feasible?

It is beyond the scope of this document to present detailed proposals on how research and development activities could be directed within the Community. But experts are increasingly coming round to the view, which deserves mention here, that the least developed regions in the Community will have to adopt a different approach from that of the traditional centres of industry with planned infrastructure - and applied research, technology counselling, promotion of small and medium-sized firms, introduction of specific programmes followed up by the creation of industries adapted to the needs of the region.

47. It would be helpful if the Commission could at some point investigate these matters in a comprehensive study and then prepare detailed proposals for a reorganization of Community research to take regional distribution into account.

VII. The connection between employment, short-term economic policy and research

48. Industrial history shows that economic activity in the past has always coincided with technical innovation. This applies to the invention of the steam engine, the railways, the motor car and aeroplanes. It may well be that information technology will generate similar growth. But this will not automatically create enough new jobs. We must therefore begin to introduce an innovation policy geared to employment.

It is also important to notice that this process of technical innovation is being accompanied by a social process creating new relationships not only between human beings but also between human beings and nature which transcend capitalist exploitation. Post-industrial society must not be geared to the selfishness of the owner and consumer.

Research policy must not be perverted to become the mechanical tool of capital expansion, but should help to uncover the positive potential of the development process.

VIII. The role of the research worker

49. Research policy is intimately linked to the position of research workers. This raises the question of mobility, employment and freedom of decision. There is a need above all for young research workers.

The Commission's initiative to help set up international research teams in Europe by promoting language courses is a step in the right direction. The decisive factors will, however, be whether sufficiently dynamic research projects are offered, the necessary basic funds are made available, and, not least, whether these research groups can be endowed with a convincing,high-quality image. (The outflow of young, qualified researchers to the USA is in part accounted for on the largely psychological grounds of good reputation). As well as taking full advantage of available opportunities, it will be important to establish a political and social framework that will facilitate the transfer of researchers from research institutes to industry and/or the universities.

We need a forward-looking, consistent research policy. (The recommendations of the Strasbourg Conference from 20-22.10.1980 as set out in Volume 2 deserve attention in this context). This means that a constant effort must be made to identify the most dynamic areas of research. In conjunction with the ESF, which is already endeavouring to pinpoint the main areas of future research, and to spot potential winners, a continuously renewable research group could be set up to determine what will be the main growth areas in the future and estimate the potential of new fields of research. Experts, who must be given their full say, are particularly motivated by the desire to identify the most dynamic areas of research.

50. Nor can research policy be viewed in isolation from the social forces motivating it. In addition to researchers, trade unions and works councils must be involved in the fundamental research decisions affecting society and individual firms. Working people must be involved in innovation and the resultant changes in their working and everyday life. The Economic and Social Committee and the Commission could play a pioneering, transfrontier role in this respect.

IX. The Joint Research Centre

51. The Community has its own research institution, the Joint Research Centre (JRC). The Commission defines its role as follows:

- to guarantee independent counselling and assessment
- to play a central role in selected research fields
- to advise the Commission.

We should be chary of accepting this assessment. Does the JRC really play a central role in solar technology (22.9), in hydrogen (14.1), in fusion (26.1) and in high temperature materials (14.9)? The figures in brackets, which show the level of spending in million EUA in the 1980-83 four-year programme, cast some doubt on this assertion. It certainly does not apply to fast breeders, in which the JRC is involved in some areas only, nor presumably to light water reactors. Even in the area of nuclear safety, where the JRC should play a central role, there are limits to how far it can go.

52. It is also to be feared that it will not be possible to implement the Super Sara Project, important to the JRC as it is, in the form originally planned. The cost will probably be well above the estimates. The experiment will probably be carried out at lower temperatures, so that the melting point of the materials will not be approached. The safety and theoretical expectations of the experiment will not therefore be realized. It remains to be seen, however, whether the Italian reactor safety commission, as the authorizing body, will approve this reduced programme.

The Member States have approved small, direct-action JRC programmes in these areas, but without being diverted from their overall national approaches. Nor does the JRC play a leading role in the assessment of individual policies. Thus, for example, the report of the Bundestag Committee of Inquiry investigating future nuclear energy policy worked on a purely national basis although its recommendations were very much European in nature. We must therefore ask why the JRC is so willing to be excluded? Or is it prohibited (by the Council?) from making its own views on these issues known? At all events it is hardly true to speak of independent counselling and assessment.

53. It is also striking that some 71% of the expenditure under the four-year programme is earmarked for nuclear activities. Granted this represents a major improvement on 1972 when 100% of the expenditure was on nuclear activities. It is nevertheless unsatisfactory, particularly if the JRC is to be placed on a secure footing for the future.

The JRC should however, be retained and developed further. Its usefulness and contributions are appreciated. In particular the European Parliament commends the staff of the JRC.

54. We recommend the following steps to be taken to develop the JRC further:

- the JRC should as far as possible be self-administering, and should give its scientists a full say in its affairs;

- it should cooperate with industry in the chosen areas of research, and industry should contribute to the research costs. Efficiency in the organization of research should have priority. Its considerable autonomy, and its opportunities to cooperate both with interested branches of industry in and out of the Community and with other national and international research institutions, should expose the JRC to the bracing wind of competition. The JRC and its research programmes should also be subject to the setting of objectives and monitoring by Parliament;

- the new draft multiannual JRC programme must be submitted to the European Parliament in good time, i.e. before the end of 1982 at the latest; it should also be discussed and approved with the researchers themselves and with the trade unions;

- without anticipating Parliament's consultation on the multiannual programme, the following main points of the new programme can be outlined here:

  1. the JRC should become a coordination and research centre on problems of nuclear, biological and chemical safety in the medium term;

  2. it should coordinate matters of cooperation with Third World countries in the area of research;

  3. it should improve technological consultation in the Community through information and coordination in European research;

- flexibility of staff must be increased. The JRC should be in a position to commit the specialists it needs for its programmes in an unbureaucratic way. The present unsatisfactory age structure should be relaxed in favour of younger elements. The Ispra centre should be involved in exchange and mobility programmes for European research teams;

- work on hydrogen production using a thermochemical circuit, which has been going on for some years at the JRC, is particularly encouraging. The progress made in this area justifies the construction of a demonstration plant at ISPRA as soon as possible;

- the research centres in Karlsruhe, Petten and Geel should continue their activities in their specialized areas. They are unreplaceable in these capacities. Their experiences have been so encouraging that it is recommended that the following programmes be expanded:

  - high temperature materials,

  - reference materials and measuring procedures for dangerous substances of chemical or biological origin.

55. Financing of the high flux reactor in Petten must be secured beyond 1984. It will be necessary to determine whether the Community or individual Member States should contribute more to the overall costs.

X. Coordination, European cooperation and new Community research

56. Other research projects that do not fit into this framework but that are subject to Community decisions, should be allocated to existing university and business institutes using available national capacities supported by Community funds. The establishment of any new common research centres is rejected. But new research projects could be established in existing national institutes, with financial support and coordination from the Community where necessary. Here, in addition to the technical side of research, those aspects that relate to the social impact of technology, especially energy technology, should in particular be supported.

57. Other areas of research, to be allocated according to circumstances, must be established in order to conform to certain provisions of the Treaties:

- The common transport policy to be established pursuant to Articles 74 ff of the EEC Treaty calls for basic research on transport problems. Community participation would be especially welcome in the field of trans-frontier traffic. The Community could also help to arrange demonstration projects. Projects for high-speed international trains, for example, could be coordinated at Community level.

- Article 41(a) of the EEC Treaty stipulates 'an effective coordination of efforts in the fields of ... the dissemination of agricultural knowledge'. Although new projects or equipment can be financed jointly and agricultural policy accounts for the largest part of the Community budget by far, agricultural research expenditure is an insignificant proportion of total research expenditure. Changes should include the following: further improvements in the quality of foodstuffs, reducing the impact on the environment through further development of integrated plant protection, reducing energy input in agriculture by such means as recycling and the development of biological nitrogen fixation techniques, research into prevention and cure of animal diseases, the use of feeding methods acceptable to the consumer, subject to consultation of experts on nutritional science, etc.

XI. Relations between the Community and Third World countries in the field of research policy

58. Since the early 70's there has been a fundamental change in international relations with far-reaching repercussions for the Third World. A new international division of labour is emerging which will largely determine how science and technology and economic and social developments affect each other in future. Four questions arise in this context:

- Who is conducting research and who is controlling it?
- Who selects technologies, i.e. who decides which technologies are to enjoy priority and which neglected?
- Who decides on the allocation of resources for research and development throughout the world?
- Who benefits from scientifically-based technology and on what terms?

The answers to these questions will help to decide on the balance or otherwise of North-South relations in future. They will also show whether we are succeeding in using science and technology to mount a combined assault on world-wide poverty and social injustice.

59. Here too the European Community must act as a whole and not just as the sum of the individual states. We must enable the poor countries,

- to develop their own technologies geared to their own needs, controlled by them and reducing their dependence on imported technology
- to coordinate development goals and scientific/technical programmes, for example to increase self-sufficiency in food
- to bring their own efforts to a successful conclusion, e.g. by means of a new international order, by financial and technical aid etc.

60. Scientific/technical cooperation between the Community and the Third World, particularly the ACP States should be geared to these aims. Before concrete proposals can be made which the Community can afford, there first needs to be an assessment of its earlier activities. The Commission should be asked to supply this and Parliament must then formulate its own proposals. Without anticipating such proposals, the following can already be stated: The outcome of the 1981 Nairobi Conference on alternative energy sources for the Third World should be evaluated and related to basic strategy. The Community can provide - through the JRC - a framework for coordinating the research programmes of the different Member States in the interests of the Third World. It should supplement this framework with programmes of its own with the emphasis on energy supplies and the agricultural sector. It will be essential to implement any such projects on the spot whenever possible - i.e. in the countries of the Third World themselves.

61. In addition there should be international cooperation from which the OPEC countries should not be excluded. To be more specific, the OPEC Fund for Development represents a body with which the Community could usefully cooperate.

Efforts to stengthen cooperation should not be confined to the OPEC states but should embrace other, non-associated states. Thus in Autumn 1981 the Twelfth Conference of the Latin-American Energy Organization (OLADE) was held in Santo Domingo, comprising 26 member states. The Community allocated 2 million dollars to joint projects with OLADE in 1980; OPEC contributed 5 million dollars in the same period.

XII. Conclusion

The rapporteur has incorporated in this report most of the suggestions made to him during his talks with Ministers for Research and senior ministry officials in Italy, France, the United Kingdom, Belgium, Denmark and the Federal Republic of Germany. He also made visits to the four establishments that make up the Joint Research Centre at Petten, Geel, Karlsruhe and Ispra, during which he had intensive discussions with senior management and staff representatives.

XIII. Summary of recommendations:

1. Reorganization, i.e. a redistribution and coordination of national and European research programmes to make better use of scarce resources:

-- concentration of basic research in European programmes particularly where these require large installations (particle research, lasers, space research and astronomy, etc.).

-- European research programmes in the new technologies (microelectronics, biotechnology, information science, energy technology, marine technology, raw materials etc.) should be coordinated by the Commission and combined with the Commission's own research contributions to form an industrial strategy. European research should lead to a European industrial policy.

-- Appeals to national governments not to reduce their budgetary appropriations in the research field, and to expand them in areas where they lag behind the Community average. The Community cannot and should not make up national shortcomings with its own resources. Its role should be to coordinate national programmes.

-- An appeal to national governments to coordinate military research and economize on resources which can then be used for pioneering research.

2. Indirect action should be largely transferred to the lower, i.e. national and regional level. The Community is too cumbersome to implement small-scale programmes. This is obvious from the procedure for allocating resources although it must be said that Community procedures for the release of appropriations have often been speedier than at national level. They must be further simplified, however.

-- Community resources should be used more to coordinate national small-scale programmes and form pools of European research workers.

-- Community research should therefore concentrate on a few selected areas. The shortage of budgetary resources makes it easier to fulfill this demand. It is better to set aside important subjects and pursue a few selected programmes to a successful end than simply to scratch the surface.

-- The management of Community programmes can be decentralized where a research establishment in a Member State has achieved a substantial technical lead.

-- Small-scale programmes can also be coordinated in connection with national technological counselling. The Community should promote and encourage technology counselling, particularly for small and medium-sized undertakings; the JRC should be involved in technology counselling in the Community and with Third World countries.

3. Questions of nuclear, biological and chemical safety are better dealt with at the European level. This is an obvious area for a European programme. With its own research and by providing information and coordination, the JRC could be developed to become a safety centre and thus clearly demonstrate its usefulness. These considerations should be incorporated into the new four-year programme.

4. Particular attention needs to be given to the social acceptability of technology. This involves not only the problems of industrial societies but also the cultural acceptance of technology transfer by the Third World. This means:

-- improving the dialogue between scientists and the public

-- investigating the change in meaning of the concepts of 'work' and 'leisure'

-- improving the working environment

-- integrating the sciences to form a universal concept of science

-- improved scientific communication, for example by publishing an 'Annual Directory of European research'. This yearly progress report, which if possible should appear in a cheap edition, should also show European research in relation to non-European research.

-- the expansion or creation of a European scientific centre for seminars etc. Ispra, for example, would seem and obvious choice.

5. European 'scientific area' which already exists needs to be further cultivated and extended. We therefore propose:

-- promoting the mobility of research workers and assisting in the creation of European research teams, looking well beyond the limits of what is currently possible, with a large-scale advanced training and study programme. We need a programme of scholarships for a minimum period of three to five years. Agreement needs to be reached with industry on participation in industrial research. This could contribute both to integration of the sciences and the creation of further jobs. Appropriate social security provisions should be made.

-- there should be a two-way exchange of research workers between industry and public institutions.

-- recognition of qualifications.

-- better coordination of national research programmes.

In matters of detail we endorse the demands contained in the 1979 study presented by the European Science Foundation on the prospects for employment and the mobility of research workers in Europe.

6. As a great deal of applied research, and in some cases basic research too, is conducted by large industrial firms, ways and means must be sought to make use of research by private companies i.e. as far as possible, to harness these to the policy objectives of the Community. Industrial democracy must be extended to include research.

Also, indirect aid for research, inasmuch as large firms derive an unfair advantage from it, should be reduced, as these resources are usually simply absorbed by large companies which do not step up or redirect their research as a result.

7. Adjustments should be made to the Community budget to provide additional resources for new projects in line with the abovementioned objectives. This is also a means of reducing the one-sided orientation towards nuclear research.

8. Community research needs to be adjusted with a view to horizontal policy areas (regional policy, small and medium sized undertakings, Third World) so that it leads to a reduction in imbalances. For example research projects could be specifically awarded to certain regions. The Commission should call for a study to provide proposals for a reorientation of Community research.

9. The Treaties should be amended to give the European Parliament political powers of codetermination and supervision without which Community research lacks parliamentary legitimation. Under no circumstances can the situation continue to be accepted in which Community research is practically removed from any parliamentary accountability.

10. The Commission could organize more scientific congresses to improve information and coordination. These could be linked to the scholarship and advanced training programme. Here the Commission should work closely together with existing scientific associations.

11. Above all the Commission should play a larger role in developing the external scientific links of Member States. This would include:

-- extending and improving technological and scientific cooperation with scientists in countries in the Third World

-- better coordination and cooperation with OPEC

-- better utilization of contacts via parliamentary delegations

-- inclusion of cultural policy in technology transfer

-- creation and financing sponserships between scientists in the Community and researchers in the less developed countries.

ANNEX I

List of European Research Organizations (non-Community)

1. ESA (European Space Agency)
Headquarters: Paris, 11 European States (B, CH, DK, D, E, F, GB, IRL, I, NL, S)
Functions: European cooperation in space, development of satellites (METEOSAT (meteorology), TELECOM (telecommunications), MARECS (maritime reconnaissance), development of the space laboratory SPACE LAB and the ARIANE launcher rocket
1981 Budget: 562 m EUA
Staff: 1,363 permanent employees (a reduction in staff is currently being discussed in connection with the phasing-out of programmes)

2. CERN (European Organization for Nuclear Research)
Headquarters: Geneva, 12 European States (A, B, CH, DK, D, F, GB, GR, I, NL, S)
Function: Basic research in the field of sub-nuclear particles of material using large accelerators (SC, PS, ISR, SPS, in future LEP)
1981 Budget: 610 m Swiss Francs
Staff: approx. 3,600 employees of whom approximately 90 are scientists; approximately 2,000 researchers and holders of scholarships visit CERN each year from the Member States and other States.

3. EMBC and EMBL (European Molecular Biology Conference and European Molecular Biology Laboratory)
Headquarters: Heidelberg (EMBC: 16 European States and Israel;
EMBL: 9 European States and Israel (A, CH, DK, F, GB, I, NL, S)
Function: EMBC: Award of scholarships
EMBL: Basic research in the field of molecular biology
1981 Budget: EMBC: approx. 3m EUA
EMBL: approx. 34m DM
Staff: EMBC: only has a small secretarial with three members of staff
EMBL: approx. 240 employees, + 75 visiting research workers and scholarship holders

4. ESO (European Southern Observatory, a European organization for astronomy research in the Southern Hemisphere)
Headquarters: Garching near Munich, 6 European States (B, DK, F, D, NL, S, in future to be joined by CH and I)
Location of telescopes: La Silla (Chile) approximately 600 km to the North of Santiago de Chile on the Southern fringe of the Atacama Desert
Function: Observation of the sky in the Southern hemisphere: currently 10 telescopes; ESO has been designated the European coordinating body for the space telescope by the ESA Council
1981 Budget: approx. 38m DM
Staff: 110 staff + approx. 140 local staff in Chile

5. Eurochemic (European company for the chemical processing of irradiated nuclear fuels)
Headquarters: Mol, Belgium, 11 European States (A, B, CH, DK, D, E, F, I, N, P, S)
Function: Active reprocessing in the pilot plant designed for 15 years operation ceased in July 1974. Since then treatment of radioactive material with a view to final disposal; the company will go into liquidation on 27.7.1982 and will probably be wound up by 1992. The plant is to be taken over by Belgium for reprocessing. Belgium has as yet not taken any final decision on reprocessing.
1981 Budget: approx. 38m DM
Staff: 226

6. ILL (institut Max von Laue - Paul Langevin)
Headquarters: Grenoble, 3 European States (D, F, GB)
Function: Operation of a maximum flux research reactor for experiments in the field of nuclear and solid-state physics
Budget: approx. 200m French Francs
Staff: approx. 400

7. Other organizations include the ESF (European Science Foundation) in Strasbourg, an international agency set up by the European scientific organizations to coordinate European research (staff: approximately 15); the IIASA (International Institute for Applied Systems Analysis) in Laxemburg near Vienna, and East-West institution sponsored by scientific institutions in 17 States in which the USA and the USSR participate (Staff: 220 employees, of which 80 are scientists) the OECD sector, and in particular the IEA (Internation Energy Agency) (Staff: approx. 90) and the NEA (Nuclear Energy Agency) (Staff: approx. 85), both located in Paris; The UN Specialized agency IAEA (International Atomic Energy Agency) in Vienna (Staff: 1,428). IIASA, the OECD Organizations and the IAEA are located in Europe but their membership extends far beyond.

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ANNEX II

tabled by Mrs GROES, Mr GALLAGHER, Mrs GREDAL, Mr FICH, Mrs VIEHOFF, Mr LINDE, Mr SCHINZEL, Mr LEZZI, Mr ORLANDI, Mrs LIZIN, Mr ADAM, Mr JAQUET, Mr ARNDT, Mrs WEBER, Mr HÄMSCH, Mrs CASTLE, Mr LINKOHR, Mr ESTIER, Mr GLINNE, Mr SCHMID and Mrs SEIBEL-EMMERLING

pursuant to Rule 25 of the Rules of Procedure

on the setting up of a special secretariat to sponsor Community energy research in Denmark.

The European Parliament,

- having regard to repeated resolutions adopted by both the Council of the European Communities and the European Parliament on the promotion of research into and use of alternative energy sources,
- pointing out that in order to secure guaranteed and diversified energy supplies and reduce its dependence on imported energy to a minimum the Community must develop its own energy resources, including unconventional and untraditional resources,
- recalling the increasingly vulnerable situation of the Community as regards imports of energy, particularly oil,
- having regard to the need for energy-saving measures that will have a major and immediate impact on the overall energy balance,
- stressing the need to investigate the possibility of using alternative energy sources in the climatic, geological and geographical conditions prevailing in the north of Europe,
- considering it important that the setting up of a special secretariat to sponsor Community energy research in Denmark will make it possible to establish and compare the contribution made by different forms of alternative energy to energy supplies, efficiency and costs,
- stressing the need to determine how different alternative energy sources can be combined for different purposes, which can only be accomplished in an overall project; it will then also be possible to draw conclusions about the overall importance of alternative energy sources, as has often been described in various energy scenarios,
- pointing out that, because of its almost total dependence on imported energy, Denmark has for several years had wide-ranging ongoing research and demonstration projects on the subject of alternative energy sources such as wind power, solar energy and the biomass,
- pointing out that Denmark is the only Member State in which no permanent Community activities are as yet carried out,

1. Calls on the Commission to set up a special secretariat to sponsor Community energy research in Denmark;

2. Instructs the Committee responsible to draw up a report on the subject.

Annex III

MOTION FOR A RESOLUTION Document 1-13/82
tabled by Mrs Yvonne THEOBALD-PAOLI
pursuant to Rule 47 of the Rules of Procedure
on setting up a European Federation of Institutes
of Experimental Biology (EFIEB)

The European Parliament,

- mindful of the importance of communicating and circulating information relating to scientific research, particularly in the field of experimental biology,

- having regard to the existence, in all the Member States of the Community, of numerous institutes of scientific research in such disciplines as pathology, immunology, nutrition, agronomics, biochemistry, pharmacology and neural science,

- considering that it would be of benefit to those engaging in research, and to research itself, to institutionalize the exchange of information between scientists working in such institutes by the creation of appropriate channels of communication,

1. Asks the Commission to invite all European institutes of research in the field of experimental biology to join a European Federation of Institutes of Experimental Biology (EFIEB). Initially, the role of this Federation will consist in organizing annual multidisciplinary scientific meetings with the aim of generating a competitive spirit among research institutes, which would endeavour to take an active part in such proceedings;

2. Calls for the proposed EFIEB, once established, to launch a multi-disciplinary scientific review and set up a centre responsible for scientific documentation and for compiling and updating information on current research potential;

3. Decides to encourage any measures aimed at bringing biological science to the attention of the public authorities in the Member States with the aim of creating a scientific interest-group covering every aspect of biological science, so that the benefits of this discipline might be made generally available throughout Europe.